

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

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|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--|
| To: <div style="text-align: center; margin-top: 20px;">see form PCT/ISA/220</div> | | <div style="text-align: center; margin-top: 20px;">Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)</div> | |
| Applicant's or agent's file reference see form PCT/ISA/220 | | FOR FURTHER ACTION See paragraph 2 below | |
| International application No. PCT/RU2005/000209 | International filing date (day/month/year) 18.04.2005 | Priority date (day/month/year) | |
| International Patent Classification (IPC) or both national classification and IPC G06K9/00 | | | |
| Applicant INTEL CORPORATION | | | |

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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| Name and mailing address of the ISA: <div style="text-align: center;">  </div> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> | Authorized Officer <div style="text-align: center;"> Rimassa, S Telephone No. +49 89 2399-2068 </div> |
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/RU2005/000209

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/RU2005/000209

Box No. V Reasoned statement under Rule 43*b/s*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

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|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-17 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-17 |
| Industrial applicability (IA) | Yes: Claims | 1-17 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: Viewpoint Independent Detection of Vehicle Trajectories and Lane Geometry
José Melo, Andrew Naftel, Alexandre Bernardino, José Santos-Victor
ICIAR - Porto, Portugal, Sep.29 - Oct.1 2004
- D2: Learning Surveillance Tracking Models for the Self-Calibrated Ground Plane
J. Renno, J. Orwell and G.A. Jones
British Machine Vision Conference 2002

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document) a method of analysing video frames capturing a 3D scene over time to automatically generate a road map of the 3D scene (cf. abstract) comprising:

- detecting position of object in the video frames (cf. abstract and section 1),
- estimating road boundaries of the 3D scene using the object position to generate the road map (cf. section 4).

In the context of road surveillance is known from document D2 that the tracking of objects can be improved without relying on labour-intensive calibration procedure under the so called "ground plane constraint" (cf. last paragraph of section 1). The auto-calibration procedure under the ground plane assumption comprise the steps of:

- estimating 3D transformation parameters for the object (cf. sections 2-2.1 and figure 1), and
- predicting heights of the object (cf. section 2.2).

It is considered that the skilled person, instructed to implement the method of document

D1, would consider to integrate in it the known auto-calibration procedure of document D2, thereby arriving at the method of claim 1.

Therefore the subject matter of claim 1 cannot be considered as involving an inventive step (Article 33(3) PCT).

The same reasoning applies to the subject-matter of the corresponding independent claims 7 and 13 which define substantially the same subject-matter of claim 1 in terms of an article and a system.

Dependent claims 2-6, 8-12 and 14-17 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

Claims 2, 8 and 14: the height map is a straightforward byproduct of the method, the estimation of the height map does not imply an inventive step.

Claims 3, 5, 9, 11, 15 and 16: removing outliers is a very common expedient to improve estimation, see for example section 4 of document D1, the claims are therefore not inventive.

Claims 4 and 10: foreground object detection is a common procedure for object tracking (see for example the document cited in the bottom of page 2 of the description), the claims therefore do not establish an inventive step.

Claims 6, 12 and 17: region growing, see document D1, last line of page 458 (clustering trajectories, viz object positions).

The cited documents D1 and D2 should be indicated in the description as relevant state of the art (Rule 5.1(ii)).

The subject-matter of the independent claims should be delimited against the disclosure of document D1 (Rule 6.3b(I)(ii)).

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/RU2005/000209